

Perspectives on Sexual and Reproductive Health
Volume 34, Number 3, May/June 2002

Contraceptive Method Switching in the United States

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CONTEXT: Switching among contraceptive method types is the primary determinant of the prevalence of use of specific contraceptive methods, and it has direct implications for women's ability to avoid unintended pregnancies. Yet, method switching among U.S. women has received little attention from researchers.

METHODS: Data from the 1995 National Survey of Family Growth were used to construct multiple-decrement life tables to explore the gross switching rates of married and unmarried women. Within each group, discrete-time hazard models were estimated to determine how women's characteristics affect their switching behavior.

RESULTS: Overall rates of method switching are high among both married and unmarried women (40% and 61%, respectively). Married women's two-year switching rates vary from 30% among women who use the implant, injectable, IUD or other reversible methods to 43% among nonusers, while unmarried women's rates vary from 33% among women who use the implant, injectable or IUD to 70% among nonusers. Multivariate analyses of method switching according to women's characteristics indicate that among married women, women without children are less likely than other women to adopt sterilization or a long-term reversible contraceptive (the implant, injectable or IUD). Older married women have a higher rate than their younger counterparts of switching to sterilization, but are also more likely to continue using no method. Among unmarried women, younger and more highly educated women have high rates of switching to the condom and to dual methods.

CONCLUSIONS: Women's method switching decisions may be driven primarily by concerns related to level and duration of contraceptive effectiveness, health risks associated with contraceptive use and, among single women, sexually transmitted disease prevention.

Perspectives on Sexual and Reproductive Health, 2002, 34(3):135-145

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Significant proportions of U.S. women switch contraceptive methods. Indeed, when all method-related reasons for stopping use are considered, two-year discontinuation rates are as high as 90% for some methods; rates are particularly high among unmarried women.¹ As a result, the rate of method switching is the primary determinant of the prevalence of use of specific contraceptives. Further, because changing methods generally alters a woman's level of contraceptive protection, method switching has direct implications for preventing unintended pregnancy.

Despite its critical role in fertility regulation, U.S. women's method switching behavior has received little attention from researchers. In this article, we help fill this gap and

address the "long-standing need to move research beyond analyzing static measures of contraceptive use and to consider the behavioral process as a whole."² Specifically, we examine married and unmarried women's rates of movement among method types, and explore how women's characteristics affect their risk of changing methods.

BACKGROUND

The bulk of demographic research on contraceptive choice investigates the relationship between characteristics of individuals and their partners and their contraceptive use at one point in time. These studies are regarded as analyses of method choice because individuals are assumed to engage in a continuous method-selection process. However, while implicitly acknowledging that current contraceptive use is the outcome of multiple decisions about method discontinuation and adoption, these investigations do not differentiate the effects of either type of decision. By failing to do so, they provide an incomplete picture of the decision-making that leads to method use.

For example, there is substantial interest in understanding the determinants of dual-method use, defined as the joint use of the condom for protection from sexually transmitted disease (STD) and a highly effective method for pregnancy protection. However, if we simply examine women's dual-method use at one point in time, we cannot develop an understanding of its true role in women's fight against these two threats. That is, we cannot determine the extent to which dual-method use occurs because users of effective contraceptive methods add the condom for disease protection, because condom users are adopting a more effective method as a companion method for pregnancy protection or because women who use less-effective pregnancy and disease prevention methods adopt both methods to increase their level of protection from both threats. The relative frequency with which sexually active women take these paths may provide important information about the extent to which the threats they face motivate their adoption and use of dual methods. Examining which methods women choose upon discontinuing dual-method use can provide equally important information about women's motives.

In addition, method prevalence analyses provide no information about women's duration of method use. For example, these investigations fail to show whether women tend to adopt dual methods for relatively short periods when perceived STD and pregnancy risks are highest, or as their primary method for extended periods.

Despite considerable interest in the contraceptive switching behavior of women in developing countries,³ this topic has received little attention in the United States. The only systematic investigation of U.S. women's contraceptive switching among a representative sample of women was conducted more than a decade ago and was limited to married women.⁴ That investigation found that married women had high discontinuation rates for all reversible method types, which is consistent with findings from research on method discontinuation.⁵ Furthermore, not only were women's discontinuation rates inversely related to method effectiveness, but women generally moved from more effective to less-effective methods.

A 1999 analysis of the 1995 National Survey of Family Growth (NSFG) provides two sets of estimates related to the probability of switching methods: method-specific

probabilities of discontinuation for "method-related reasons" (including contraceptive failure); and probabilities of adopting specific methods after discontinuing use of a prior method.⁶ These estimates can be used as an indirect way to examine women's contraceptive switching, if one assumes that the probability of adopting any specific method is independent of the type of method that was discontinued. However, the earlier investigation of contraceptive switching among married women does not support that assumption.⁷

All other studies that have explicitly examined contraceptive switching in the United States are limited by the nature of the sample used or the types of switching outcomes they considered. A few investigations have focused on women's likelihood of discontinuing use of a specific method and have examined whether women switch to a different method or no method while they are exposed to the risk of unintended pregnancy (that is, while they are sexually active, nonsterile and not pregnant, postpartum or trying to conceive).⁸ Other studies have focused on the risk of switching to a specific method type, such as the injectable depot medroxyprogesterone acetate⁹ or dual methods.¹⁰ Given these restrictions, these analyses offer only a limited understanding of women's contraceptive switching. Their value is further limited because their study populations have been recruited mainly from family planning clinics, making them unrepresentative of all women in the population.

In this article, we extend previous research on contraceptive switching in a number of ways. We use a nationally representative sample to investigate and compare the method use dynamics of married and unmarried women, and provide information about the proportion of women who rely on specific methods for as long as two years. Further, using multivariate analyses, we examine the determinants of contraceptive method switching for each marital status group. Thus, we not only update what is known about women's contraceptive switching behavior, but also place the results from more narrowly based studies, such as those focusing exclusively on the switch to dual methods,¹¹ within the larger context of women's contraceptive switching behavior.

Data and Methods

We use data from Cycle 5 of the NSFG, which surveyed 10,847 women aged 15-44 in the civilian household population in the conterminous United States. The women were sampled from households that had participated in the 1993 National Health Interview Survey. Women were interviewed in 1995 using both computer-assisted personal interview and audio computer-assisted self-administered interview modes of administration. Black and Hispanic women were oversampled.

Cycle 5 of the NSFG is uniquely suited for a study of contraceptive method switching because it used an event history calendar to collect month-by-month information on contraceptive use and important life events during an observation period dated from January 1, 1991, to interview, or about four and one-half years. In addition to information about method use, the survey contains critical information on dates of conceptions, pregnancy terminations, onset of infertility, marital and relationship transitions, and the start and end of periods of sexual abstinence. It also contains other information necessary for this analysis, such as women's reports about whether they discontinued use of their contraceptive method before becoming pregnant. The nature

and quality of the calendar data and other information used in this study are discussed in more detail elsewhere.¹²

We used the month-by-month calendar of method use as the basis for our analyses. For each marital status group, we examined the risk of stopping one method (the "origin" method) and adopting a new method (the "destination" method). Even with as large a sample as the NSFG's, some methods are used by so few women or have such a low discontinuation rate that it is not possible to consider every available method individually. We therefore combined some method types. To do so, we considered both the similarity of methods in terms of their primary characteristics and the distribution of women in the sample by method use. For married women, the origin methods are long-term reversible methods (the hormonal implant, the injectable and the IUD); the pill; condoms, including condom use in combination with other less-effective methods; all other, less-effective reversible methods; and no method (while the woman is at risk of unintended pregnancy).^{*} The destination methods for married women are the same as the origin categories, plus sterilization (both male and female).

For unmarried women, the origin methods and destination methods are the same as for married women, with two exceptions. First, enough unmarried women combine methods to allow for dual-method origin and destination categories.[†] Second, because of the relatively infrequent use of sterilization and long-term reversible methods among unmarried women, we combined them into a single destination category (long-term).

Exposure Intervals

We reformatted the NSFG data for use in life-table analyses so that we could examine the risk of stopping use of each origin method and switching to a specific destination method. We used these data to obtain information about intervals of continuous contraceptive use among married and unmarried women at risk of unintended pregnancy. These "exposure intervals" constitute the units of analysis, and women who switched methods during the period of observation may contribute more than one interval to the study. Additionally, women whose marital status changed may contribute observations to both the married and the unmarried data.

To be included in the analysis, an exposure interval must have been initiated during the observation period.[‡] We truncated the observation of method use at 10 months prior to interview because the data in the NSFG did not allow us to identify the month of conception for women who were pregnant at the time of the interview. Our analyses examined method switching during the first 24 months of use. Given that we used a life-table approach to estimate switching rates, these rates can be interpreted as the cumulative probability of experiencing a switch to each destination method (that is, the first method that a woman adopted after leaving her origin method, and not necessarily the method she was using 24 months after starting use of the origin method).

Because we examined 24-month switching rates, we censored months of use beyond that duration. In assessing duration of use, we considered intervals to be continuous if they were interrupted by periods when the woman was not having intercourse, but the woman did not contribute exposure intervals in those months.[§] Exposure intervals

were right-censored by end of observation, stopping use to conceive, conception, a change in marital status or infertility.

Switching Events

In general, a contraceptive method switch is defined to have occurred in one of three circumstances. The most common is when a woman reported having used different methods in consecutive months. Because we were also interested in estimating the risks of switching to and from no method, if a period of method use was followed by one or more months of nonuse, we considered this a switch from that method to no method. Similarly, if a period of nonuse was followed by the resumption of method use, we considered that event a switch from no method to whatever method was adopted.

The second circumstance defining a switch is when the use of two methods (including nonuse) was separated only by a period when the woman reported that she was not having intercourse. The final circumstance defining a switch is when two methods were used sequentially in the same month, and the woman had used one of the methods in the prior month and the other in the subsequent month. If the use of different methods was separated by a pregnancy or by the woman's or her partner's becoming infertile, it is not considered a switch.

Analytic Approach

In the first part of our research, for each marital status group, we estimated Kaplan-Meier multiple-decrement life-table probabilities of switching from each origin method to each destination method. In these calculations, we terminated observation of method use if any of the following events occurred: contraceptive failure, discontinuation of method use to conceive, infertility and loss to follow-up. Thus, we were able to show the proportions of users of each origin method who switched within two years after initiating use if they did not stop use for any other reasons. We used case weights to adjust the estimates for both the oversampling of black and Hispanic women in the NSFG and differential nonresponse. We used a bootstrapping technique to obtain 95% confidence intervals for the method switching rates. We also examined the proportion of adopters of each method type who previously used each origin method. In examining differences in these method origins, it is important to note that they are a function of both the origin distribution of all method users and duration-specific transition rates (not cumulative switching rates).

Next, we examined the social and demographic determinants of switches between method pairs using discrete-time hazards modeling.¹³ Each model in this analysis examines the risk of switching from a specific origin method to a specific destination method. Thus, the coefficients associated with categorical variables indicate the relative increase or decrease in the risk (the log of the hazard)—compared with the risk among women in the reference category—of stopping use of the origin method to switch to a specific destination method (where the risks of switching to a different method or of experiencing a censoring event are competing risks). For interval-level variables, such as age, the coefficients indicate the relative change in the risk of switching associated with a one-unit increase in the variable's value. We also estimated hazards models of the risk of switching from a specific origin method to any

destination method.^{**}

We examined nine critical characteristics of women making contraceptive switching choices as covariates in the hazards models: age, race, Hispanic origin, educational attainment, parity, religion, family arrangements during childhood, age at menarche and duration of use.

Age, measured in years, was included for four reasons. First, it is negatively related to the probability of experiencing an unintended pregnancy, because fecundity and frequency of intercourse decline with age.¹⁴ Second, age is positively related to the costs of an unintended pregnancy, because older women are at higher risk than younger women of experiencing negative health outcomes for both themselves and their children should they become pregnant,¹⁵ and are less likely to desire additional children. Third, the possible adverse health consequences related to pill or other hormonal method use are greater for older women. Finally, younger, unmarried women tend to engage in higher-risk sexual behaviors,¹⁶ possibly increasing their demand for the condom and dual methods.

We included race and ethnicity (measured with dichotomous variables indicating whether the woman is black and whether she is Hispanic) because they are believed to reflect cultural differences in values and preferences that were not measured in the NSFG. In addition, given the higher prevalence of STDs among minority populations, minority group members are more likely than others to perceive themselves to be at high risk of acquiring these diseases and modify their behavior accordingly.¹⁷

Education, measured in years of completed regular schooling, was included because better-educated women generally have greater access than those with less schooling to information about contraceptive methods and their risks and benefits. Furthermore, the potential costs of a birth are greater for better-educated women because their market wage is higher than that of less-educated women and thus they have more to lose by being out of the workforce.

We included parity because childless women are more likely to be postponing a birth than preventing a birth. We considered whether women have any religious affiliation^{††} because this factor affects the costs of an unintended pregnancy in that some religions and religious denominations strongly object to abortion. In addition, those with no religious affiliation tend to have more liberal sexual ideologies and engage in higher-risk sexual behaviors than others,¹⁸ increasing the value of disease prevention for these women, especially if they are unmarried.

Three variables served as controls, but are not presented in our tables. We considered whether a woman grew up in an intact family (that is, if she lived with both natural parents most of the time from age five to 15), because women from stable families would probably be more likely than others to view marriage as a stable union, and this would lower the cost of an unintended pregnancy. We used age at menarche to capture differences in perceived fecundity; an older age is associated with a lower perceived fecundity. Finally, we included duration of use to capture any time dependence in the risk of method switching, because we found in a previous study that for some methods, switching rates decline as duration of use increases.¹⁹ We used three continuous (spline) variables to capture the impact of duration of use during months 1-3, 4-12 and

RESULTS

Descriptive Analyses

A considerable amount of movement occurs among method types: Overall, 40% of married women switch methods within a two-year period. Two-year contraceptive switching rates range from 30% among women who use the implant, injectable, IUD or other reversible methods to 43% among nonusers ([Table 1](#)). Rates of switching to sterilization and long-term reversible methods are substantially lower than rates of switching to the remaining methods, including the pill. Further, rates of movement to specific destination methods generally do not differ by origin method. For example, the rate of switching to the condom from the pill is not statistically significantly different from the rate of switching to the condom from any other origin method. One notable difference is found in the rate of switching to male sterilization, which is significantly greater among women who switched from condom use than among women with any other origin method (6% vs. 0-2%) except other reversible methods. Further, the condom is the only origin method for which the rate of switching to male sterilization is significantly greater than the rate of switching to female sterilization (6% vs. 2%).

The strong link between condom use and male sterilization is even more evident in the distributions of married users who adopt each method type by their origin method ([Table 2](#)). Twenty-six percent of married users originally used condoms. Therefore, if the likelihood that a woman will choose a given destination method is unrelated to her origin method, one would expect that among women who switched to a given destination method, the proportion who had previously used condoms would also be 26%. However, in the case of male sterilization, 52% had switched from condom use. Thus, twice as many women whose origin method was the condom adopted male sterilization as would be expected by chance. By contrast, although the proportion of women whose origin method was the pill (26%) or no method (25%) is about the same as the proportion whose origin method was the condom, women who switched from these methods are somewhat underrepresented among male sterilization adopters (16% and 14%, respectively).

In addition, although 25% of married women initially used no method, 50% of women who switched to the pill are former nonusers. Furthermore, given that 19% of married women initially used other reversible methods, there are fewer than expected former users of these methods among adopters of long-term reversible methods (8%).

Unmarried women's rates of switching methods are greater than those among married women; the overall two-year switching rate for these women is 61% ([Table 3](#), page 140). Their total switching rates range from 33% among implant, injectable and IUD users to 70% among nonusers. Unmarried users are also somewhat more likely to switch to no method than are married users (13% vs. 9%); this differential is especially marked among women who originally used long-term reversible methods (16% vs. 6%), the pill (17% vs. 11%) or the condom (21% vs. 13%). Among unmarried women who used these methods, nonuse is the most common destination method. In addition, as might be expected, the condom is the most popular destination method (excluding

no method) except among those who originally used dual methods.

Women who used dual methods have a 68% discontinuation rate. Thus, while many women may use dual methods for a short period, nearly one-third continue use for two years or more. Those who switched overwhelmingly switched to the pill—50% overall, compared with 10% who switched to the condom and 4% who switched to long-term reversible methods. Additional analyses indicate that nine in 10 former pill users resumed pill use when they stopped using dual methods (not shown).

An examination of the origin methods of women who adopt specific new methods confirms that there is a special link between pill use and dual-method use ([Table 4](#)). Former pill users are highly overrepresented among adopters of dual methods: Among women who switched to dual methods, 45% switched from the pill, even though it was the origin method for only 23% of unmarried women. Similarly, former dual-method users are overrepresented among adopters of the pill. Although only 8% of women began as dual-method users, 26% of women who switched to the pill had that method origin.

Another important finding is the apparent link between condom use and nonuse. Former nonusers are very overrepresented among adopters of condoms, and former condom users are similarly overrepresented among adopters of no method.

Multivariate Analyses

- *Married women.* According to our multivariate analyses, a married woman's age at the start of an exposure interval is significantly related to her switching behavior. Older women who are using no method while at risk of an unintended pregnancy, and who probably perceive themselves to be of lower fecundity than younger women, are less likely than younger nonusers to switch to method use ([Table 5](#)). However, when they switch, they are more likely than other women to switch to sterilization and less likely to switch to the pill, which is associated with elevated health risks for older women. As expected, older women are more likely than younger women to switch to sterilization from any origin method. In addition to having a reduced likelihood of switching from no method to the pill, older women have a reduced likelihood of moving from pill use to nonuse.

Similarly, older women are less likely than younger women to switch from the condom to less-effective reversible methods or to long-term reversible methods. Older women using other reversible methods are less likely than younger users to switch to the condom. They also are less likely to switch to the pill and more likely to switch to nonuse, a pattern that is probably rooted in perceptions of both fecundity and the potential health risks of pill use.

Compared with married women of other races, black women generally are more likely to stop using a method to switch to sterilization. The exception is that they have a reduced rate of switching from less-effective reversible methods to sterilization. Black women have elevated rates of switching from the pill to no method and from no method to the pill. By contrast, they have reduced rates of switching between the condom and other reversible methods, and between other reversible methods and no method. The other relationships found for black women include a reduced rate of movement from the condom to the pill and an elevated rate of switching from no

method to the condom. Taken together these results suggest that black women experience little movement among the less-effective method types and, except for nonusers, tend not to switch to a reversible method type that is more effective than their origin method.

By contrast, Hispanic women generally have a reduced likelihood of switching to sterilization. Only nonusers diverge from this pattern, with an elevated rate of switching to sterilization. Hispanic users of other reversible methods and nonusers are also more likely than other women to switch to a long-term reversible method and to the condom. Those using the condom have a greatly reduced likelihood of switching to the pill.

As educational attainment rises, women's rate of switching from the pill to less-effective reversible methods and nonuse declines, but the rate of switching from the pill to the condom rises. For condom users, more years of education leads to reduced rates of switching to sterilization, long-term reversible methods and the pill. Education has the opposite effect on switching to these methods among married women who use other reversible methods. Nonusers with more education have increased rates of switching overall and increased rates of switching to sterilization, the pill and other reversible methods. These results suggest that the more education a woman receives, the more likely she is to move from less-effective methods, including nonuse, to more effective methods, including sterilization. This probably reflects the higher opportunity costs of an unintended birth among women who have attained a high level of education.

Clearly, the most important impact of having no children is reducing women's risk of switching to sterilization. Indeed, not only is the effect of parity large in the pill and nonuse models, but the variable had to be omitted in the models for the condom and other reversible methods because no childless women using these methods switched to sterilization. Further, except for pill users, no childless women switched to a long-term reversible method, which may not be useful for short-term delays in childbearing. Childless women also have a reduced risk of switching from no method to the pill and, particularly, to other reversible methods. This relationship could reflect that for many childless nonusers, the costs of a birth may be low because they intend to eventually have children. It may also reflect a perception of subfecundity among some of these women. Childless women also have a reduced rate of switching from the condom to other reversible methods, and an elevated rate of switching from other reversible methods to both the pill and no method. Again, women's choice of destination method is probably determined by their perceived fecundity and costs of a birth.

We hypothesized that women with no religious affiliation would have a reduced rate of switching to more effective methods and an elevated rate of switching to less-effective methods because the psychic costs of an abortion would be reduced for these women. However, our findings do not support this hypothesis. For example, while women who have no religious affiliation and who use condoms have a reduced risk of switching to sterilization, those who are pill users have elevated rates of switching to sterilization or a long-term reversible method, and a reduced rate of switching to no method. As another example, women with no religious affiliation who use other reversible methods have increased rates of switching to sterilization but also to no method.

- *Unmarried women.* Our multivariate analyses indicate that, as with married women, age is significantly related to unmarried women's switching behavior. Except among dual-method users (who are already using condoms), older unmarried women are less likely than younger women to switch to the condom ([Table 6](#)). Further, older women who use condoms or other reversible methods are less likely to stop using their method to adopt dual methods or the pill. Combined with the finding that older women have reduced rates of switching from other reversible methods and nonuse, this suggests that older women have reduced demand for methods that are highly effective in preventing either pregnancy or STDs. Older dual-method and condom users have somewhat elevated rates of switching to a long-term highly effective method, but older condom users are also more likely than their younger counterparts to switch to no method.

Black women are less likely than others to switch from any method to either the pill or less-effective reversible methods. They have an elevated rate of switching from dual methods to no method, from the pill to either dual methods or the condom, and from the condom to dual methods. Further, black users exhibit greater loyalty to the condom overall than women of other races. Overall, these results suggest that when black users change methods, the switch is likely to be to a method that increases their level of protection against STDs, rather than to a method that increases their protection against unintended pregnancy.

Hispanic origin has few effects that are consistent across destination methods. For example, Hispanic pill and condom users and nonusers are significantly less likely than non-Hispanic women to switch to dual methods. However, among users of less-effective reversible methods, Hispanic women are more likely than others to switch to dual methods. Similarly, Hispanic women have an increased rate of switching from dual methods to the condom, but a reduced rate of switching from the pill to the condom. They also have reduced rates of switching to the pill from either the condom or no method and of switching to a long-term method from the condom (there were no switching events), suggesting that a quest for contraceptive effectiveness is not a primary motive for switching methods among Hispanic women.

The results for education indicate that better-educated condom users have an increased rate of switching to a long-acting method, but their counterparts among pill users are less likely to adopt one of these methods. In addition, among dual-method users and pill users, women with more education are more likely to switch to other reversible methods and nonuse, respectively—the least effective method destinations. Most important, except for women whose origin methods provide protection against STDs (dual methods and the condom), those who are highly educated show an elevated rate of switching to the condom, suggesting that they may be seeking greater STD protection. Finally, women with more education are more likely to switch to a method from nonuse and have elevated rates of switching from nonuse to the pill, the condom and other reversible methods.

Regardless of their origin method, childless women are less likely than women with one or more children to switch to a long-term method. However, they are more likely than women with children to switch from the pill, condom or no method to dual methods. Childless women are also more likely to switch from the pill or no method to a less-

effective reversible method, and from the condom to no method.

Unlike our results for married women, our findings for unmarried women are consistent with our hypothesis regarding the effect of religious affiliation on switching behavior. For unmarried women, having no religious affiliation is negatively related to the rate of switching from every origin method to the pill. Similarly, women with no religious affiliation are less likely to switch from the pill to a long-term method, and are more likely to switch either from the pill to less-effective reversible methods or from the condom to no method. However, women with no religious affiliation are also more likely to switch from dual methods or the pill to the condom, and more likely to switch from the pill or condom to dual methods. The elevated rate of switching to a method offering STD protection may reflect these women's tendency to engage in riskier sexual behavior.²⁰

DISCUSSION

Our results provide important new evidence about contraceptive switching among women in the United States. One striking finding, when these results are compared with those derived from the 1986 NSFG,²¹ is the remarkable degree of stability over time in married women's switching behavior. The comparison suggests that the introduction of new methods, increasing condom use and other changes, such as reduced access to abortion,²² have not greatly altered the rates of movement among most methods. There is some evidence of greater movement between the pill and condom than existed nearly a decade ago. However, the largest apparent changes are a reduced rate of movement to no method, particularly from the pill (11% vs. 18%) and less-effective methods (10% vs. 25%), and a much lower rate of movement from nonuse, mostly to other reversible methods (7% vs. 25%).

Although these findings suggest that married women are spending less time, on average, using no method, the difference over time may be partly an artifact of the different ways in which information on method use was obtained in the two surveys. In 1986, women were asked to provide the month and year in which use of each method began and ended (within pregnancy intervals), while the 1995 survey used an event-history calendar to obtain this information. A peculiarity resulting from use of the latter method is that very few women indicated on their calendars that they began using any method in the same month that they stopped using their previous method. Instead, these events tended to be reported as occurring in adjacent months. Because the great majority of adjacent intervals probably indicated a direct switch from one method to another, we followed a protocol used in previous research²³ and coded this event as a switch.

By contrast, in the earlier survey, this pattern of adjacent but nonoverlapping intervals was much less common, and many new intervals of method use started during the same calendar month that use of a prior method ended. Thus, we coded intervals of method use that ended and began in adjacent months as being separated by a month of nonuse. This difference, in which we probably overestimated the amount of nonuse in the earlier survey and may have underestimated it in the later one, may account for much of the observed change in estimated rates of switching to and from nonuse. However, these data collection and coding differences reduced the number of observed intervals of nonuse in the 1995 survey only by about 15%.

Another notable finding for married women is the strong link between condom use and the adoption of male sterilization. The importance of this relationship may be missed when one looks only at the gross two-year switching rate of 6%. However, the strength of this link becomes clear when one considers that more than half of adopters of male sterilization have the condom as their origin method.

It is not surprising that unmarried women have higher rates of method switching than married women do, and that they are both more likely to switch to no method and to be nonusers for longer periods of time. However, the strong link between the condom and no method is somewhat surprising. The high rate of switching between these methods suggests that some unmarried women may move back and forth between them as their perceived risk of acquiring STDs shifts.

The extent to which dual-method use is a long-term choice among unmarried women is also an important finding. Indeed, dual-method users' loyalty is similar to that found for users of condoms and other reversible methods. In addition, we found that dual-method use occurs most often when pill users add the condom, although about one-third of dual-method adopters are former condom users, and there is evidence that former pill users return to using the pill alone when they stop dual use.

The multivariate results suggest that women's method switching decisions are primarily related to their desire for either short-term or long-term pregnancy protection; their desire to avoid possible health risks associated with method use; and, among unmarried women, their need for protection against STDs. The impact of desire for appropriate pregnancy protection is demonstrated most clearly in the results associated with age and parity. Among married women, older women are more likely than younger women to switch to sterilization. Childless women, by contrast, are very unlikely to adopt sterilization.

Age also ties in to the role of health risks in switching choices. Among both married and single women, older women are less likely to switch to the pill. Furthermore, older unmarried women are less likely to switch from most origin methods to long-acting methods.

The role of disease prevention in women's method switching is evident in the effects of unmarried women's race and religious affiliation. Black women, who face elevated risks of acquiring STDs, are more loyal to the condom than other women and have higher rates of switching to dual methods from either the pill or the condom. Women with no religious affiliation, whose sexual behavior is more risky than other women's, have higher rates of switching to the condom and dual methods.

Our results lend support to prior research that has found pregnancy protection, possible method-related health risks and STD protection to be the most important factors in women's decisions regarding contraceptive methods.²⁴ (These same factors also have been found to be the most salient for men's method choices, with STD protection being the most important method attribute among unmarried men.²⁵) Our research adds to our knowledge by explicitly linking these factors to women's method choices.

Overall, our finding that two-year switching rates are 30% or higher for women using

reversible contraceptive methods is somewhat disturbing. Some of this switching is undoubtedly due to changes in women's circumstances that alter how well their method fits their needs. However, this high volume of circulation also suggests that many women are probably dissatisfied with their experiences with particular methods. This is also indicated by our finding that about one in 10 women choose to abandon contraception altogether, even while they are at risk of an unintended pregnancy. Further, more than half of married women and nearly one-third of unmarried women who stop using a method continue to have unprotected sex for two years or longer, rather than adopt a replacement method. Thus, it appears that some women are unable to identify and adopt a method that adequately meets their needs, and that others may be unprepared for the side effects or other consequences of using the method they choose.

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Acknowledgments

The research reported in this article was supported by grants from the National Institute of Child Health and Human Development (NICHD). The views and opinions expressed here do not necessarily reflect the views or policies of NICHD or the Battelle Memorial Institute. The authors thank Anjanette Nelson-Wally and Audra Wenslow for their programming assistance.

*When multiple methods were used during a calendar month, we classified use according to the most effective method reported. Relying on previous research, we used the following hierarchy: sterilization, implant, injectable, IUD, the pill, male condom and other reversible methods (source: reference 1). There are two exceptions to this coding scheme. If a woman used two methods sequentially during a month, and she had used one of them alone in the previous month and used the other alone in the subsequent month, we classified her as having switched midmonth. Among single women, we also defined the joint use of the condom and a highly effective method (sterilization, implant, injectable, IUD or the pill) as dual-method use. In contrast to previous researchers, we explicitly coded women's nonuse while they were at risk of unintended pregnancy under any of three circumstances: The months of nonuse were immediately preceded and followed by periods of use; the period of nonuse overlapped with the month of a conception, and the woman reported that she had not stopped use to conceive; or the period of nonuse continued to the survey date, and the woman reported that she had not stopped using a method to conceive.

†Although condom use in combination with the implant, injectable and IUD is reported, dual-method use among unmarried women is overwhelmingly condom use in combination with pill use.

‡We had to restrict the analysis to intervals beginning within the observation period because the NSFG does not provide information on the start date for earlier periods of method use. Consequently, our results do not reflect the experiences of those who have successfully used contraceptives for longer periods (that is, women whose first month of use occurred before the beginning of the observation period and who continued using their method until the end of the observation period). This potential problem is likely to be greater for married women than for single women because of married women's lower discontinuation rates and greater reliance on sterilization. However, the switching rates we obtained for married women are remarkably similar to those we

obtained in our earlier analysis (source: reference 4), despite a growing reliance on sterilization. This suggests a high degree of stability in married women's method switching and provides increased confidence that our results reflect the earlier, unobserved experiences of women not included in the analyses.

§ For example, consider a woman who used a method for six months before switching. If she reported a two-month period when she was not having intercourse, she was counted as having used her method for only four months prior to the switch. Further, even if she stopped using her method during the time she was sexually abstinent, we considered her to have used continuously. In addition, we counted switches that occurred during a period of sexual abstinence as switches, with the accumulation of months of use of the origin method ending at the start of the period of abstinence, and the accumulation of months of use of the destination method starting at the end of the period of abstinence.

**Statistical significance levels for coefficients in the hazards models reflect the fact that the standard errors of these estimates were adjusted, using STATA, to account for clustering in the NSFG sample.

† Initially, we also identified Catholics, conservative Protestants and members of other religions, but we found very few differences across these groups and collapsed our variable to a dichotomy to simplify our presentation and focus on the religious distinction that we found to be most important.

‡ We initially created dummy variables indicating single months of duration to examine duration dependence. The variables we defined adequately captured such duration dependence in models where it was found, and their use allowed us to more easily investigate any nonproportionality in the effects of the covariates (none were identified). Further, the definition of the duration variables had very little effect on the estimated coefficients of other covariates. Because duration dependence was not of explicit interest, these variables were maintained in all models.